

REMARKS

1. Reconsideration and further prosecution of the above-identified application are respectfully requested in view of the amendments and discussion that follows. Claims 1-29 are pending in this application.

Claims 1, 2, 5, 8-10, 13, 16, 18, 19, 22, 25 and 28-29 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. Publ. No. US 2003/0223532 to Clinthorne et al. Claims 3, 14 and 23 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. in view of U.S. Pat. No. 6,005,908 to Oppelt et al. Claims 4, 6, 7, 15, 17, 24, 26 and 27 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. Claims 11, 12, 20 and 21 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. in view of U.S. Pat. No. 5,831,269 to Nakamura et al. After a careful review of the claims, it has been concluded that the rejections are improper and the rejections are therefore traversed.

2. Claims 1, 2, 5, 8-10, 13, 16, 18, 19, 22, 25 and 28-29 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. Publ. No. US 2003/0223532 to Clinthorne et al. In particular, the Examiner asserts that.

"Clinthorne et al. disclose . . . detecting substantially identical samples of each of a plurality of X-ray beams; amplifying each first sample of the substantially identical samples using a first gain value; amplifying each second sample of the

substantially identical samples using a second gain value; and forming an X-ray image from the detected X-ray beams amplified by the first gain value and the detected X-ray beams amplified by the second gain value (page 3, paragraphs [0042]+)."

It is noted first in this regard, that the claims are limited to "detecting a plurality of X-ray beams; amplifying each of the plurality of detected X-ray beams using a first gain value; amplifying each of the plurality of detected X-ray beams using a second gain value". As would be clear to those of skill in the art, each X-ray beam represents the X-rays that strike a single scintillating element. Further, it would be understood that each X-ray beam would only be capable of interacting with one side-by-side detector.

In addition, it would also be clear to those of skill in the art, that no two X-ray beams are substantially identical (e.g., X-rays are emitted at random energy levels, some X-rays interact with the target while others do not, etc.). Since no two X-ray beams are identical and since no one beam could interact with any two detectors, there could not be any such thing as substantially identical samples obtained from adjacent pixels, even under Clinthorne et al.

In addition Clinthorne et al. fails to make any claim to substantially identical samples. If the Examiner believes that Clinthorne et al. does teach substantially identical samples, then the Examiner is respectfully requested to provide a reference that establishes the basis for this assertion.

Clinthorne et al. provides a detector that includes "an array of detector pixels" (Clinthorne et al., par.

[0043]. Clinthorne et al. is also explicitly limited to "a plurality of charge amplifiers having different amplifications for different columns of the array" (Clinthorne et al., pars. [0042], [0049], [0056]). Since the charge amplifiers are associated with different columns, Clinthorne et al. uses different amplification levels for different X-ray beams.

In contrast, the specification shows a detector element 20 in FIG. 3. Paragraph [0024] explicitly states that "The detector element 20 may include a scintillating element 28 and a pair of associated photodetectors 30, 32. The scintillating element 28 and photodetectors 30, 32 together detects an X-ray beam.

It should be noted in this regard that photodetectors 30, 32 can only detect visible light. A photodetector 30, 32 cannot detect X-rays.

Coupled to the detector element 20 is a pair of associated amplifiers 34, 36 that amplify the detected X-ray beam. In this regard, "a first amplifier 34 of each detector element 20 provides a first gain value, K_1 , and the second amplifier 36 provides a second gain value" (specification, par. [0025]. Since the first and second amplifiers 34, 36 are coupled to the same detector element 20, the amplifiers 34, 36 amplify a signal from the same X-ray beam using first and second gain values.

In addition, Clinthorne et al. could not provide the same functionality as that of the claimed invention. For example, under the claimed invention each detected X-ray beam of the plurality of X-ray beams is detected by a corresponding scintillating element. The scintillating element illuminates two (or more) photodiodes, to provide two (or more) substantially identical electrical signals

(photocurrents). Furthermore, the two (or more signals) may be measured during exactly the same time interval, so the beam measurement data are coincident in time as well.

Each of the two (or more) photodiodes corresponding to the beam connects to its own amplifier, whose parameters may be optimized to one of the two (or more) discrete gain values discussed in the specification. One advantage of using two photodiodes and two amplifiers, instead of one photodiode connected to two amplifiers, is that the noise performance of the two different amplifiers can be optimized for the useable range of that gain stage.

As a specific example, the feedback resistor contributes to the electronics noise of a photodiode preamplifier. The noise current from that resistor decreases as the resistance increases, but the maximum allowable input current from the diode also decreases as the resistance increases. Therefore, if two different full-scale input currents are chosen, the lower full-scale input current (higher gain values and larger feedback resistance) will have lower input noise current, which is better for small signal photodiode current values. However, that high-gain amplifier will not be useful for large signal input values. Therefore, the large signal input values are better measured with an amplifier that has a lower feedback resistor and therefore a lower gain and higher maximum input value.

Since Clinthorne et al. does not use a single scintillating element to provide substantially identical samples, Clinthorne et al. could not provide the same functionality as that of the claimed invention. In addition, since Clinthorne et al. uses different pixels to detect different X-ray beams, Clinthorne et al. cannot

optimize the amplification of a single X-ray beam using two different amplifiers and two different amplification paths.

Since Clinthorne et al. does not provide the method steps of (or apparatus for) "detecting a plurality of X-ray beams; amplifying each of the plurality of detected X-ray beams using a first gain value; amplifying each of the plurality of detected X-ray beams using a second gain value", Clinthorne et al. does not do the same or any similar thing as that of the claimed invention. Since Clinthorne et al. does not do the same thing, the rejections are believed to be improper and should be withdrawn.

3. Claims 3, 14 and 23 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. in view of U.S Pat. No. 6,005,908 to Oppelt et al. However, a review of Oppelt et al. reveals that Oppelt et al. also fails to teach or suggest the method steps of (or apparatus for) "detecting a plurality of X-ray beams; amplifying each of the plurality of detected X-ray beams using a first gain value; amplifying each of the plurality of detected X-ray beams using a second gain value". As such, the combination of Clinthorne et al. and Oppelt et al. fail to teach or suggest each and every claim element. Since the combination fails to teach or suggest each and every claim element, the rejections are believed to be improper and should be withdrawn.

4. Claims 4, 6, 7, 15, 17, 24, 26 and 27 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. However, as demonstrated above, Clinthorne et al. fails teach or suggest the method steps

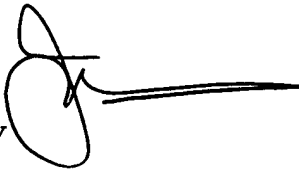
(or apparatus for) "detecting a plurality of X-ray beams; amplifying each of the plurality of detected X-ray beams using a first gain value; amplifying each of the plurality of detected X-ray beams using a second gain value".

In addition, the Examiner admits that "Clinthorne et al. is silent as to forming a first X-ray image from the detected X-ray beams amplified by the first gain value and a second X-ray image from the detected X-ray beams amplified by the second gain value" (Office Action of 7/27/04). Since the Examiner admits that Clinthorne et al. is silent in this regard, the Examiner is also implicitly admitting that there is no teaching or suggestion within Clinthorne et al. to make this modification. As such, Clinthorne et al. fails to teach or suggest each and every claim element. Since the Clinthorne et al. fails to teach or suggest each and every claim element, the rejections are believed to be improper and should be withdrawn.

5. Claims 11, 12, 20 and 21 have been rejected under 35 U.S.C. §103(a) as being obvious over Clinthorne et al. in view of U.S. Pat. No. 5,831,269 to Nakamura et al. However, a review of Nakamura et al. reveals that Nakamura et al. also fails to teach or suggest the method steps (or apparatus for) "detecting a plurality of X-ray beams; amplifying each of the plurality of detected X-ray beams using a first gain value; amplifying each of the plurality of detected X-ray beams using a second gain value". As such, the combination of Clinthorne et al. and Nakamura et al. fail to teach or suggest each and every claim element. Since the combination fails to teach or suggest each and every claim element, the rejections are believed to be improper and should be withdrawn.

6. Allowance of claims 1-29, as now presented, is believed to be in order and such action is earnestly solicited. Should the Examiner be of the opinion that a telephone conference would expedite prosecution of the subject application, he is respectfully requested to telephone applicant's undersigned attorney.

Respectfully submitted,
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